Suffolk County Community College

Michael J. Grant Campus

Department of Mathematics

Wednesday, December 18, 2019

MAT 125: Pre-Calculus II

Final Exam

Instructor:

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Please print the requested information in the spaces provided:

Student:

Name: _____

Student Id: _____

Email: _____ *include to receive the final grade via email* ONLY *if you are not getting email updates*

- *Notes and books are permitted on this exam.*
- *Graphing calculators, computers, cell phones and any communication-capable devices are prohibited. Their mere presence in the open (even without use) is a sufficient reason for an immediate dismissal from this exam with a failing grade.*
- *You will not receive full credit if there is no work shown, even if you have the right answer. Please don't attach additional pieces of paper: if you run out of space, please ask for another blank final.*

Problem 1. Suppose an angle $\theta \in [0, \pi]$ and $\tan(\theta) = -2$. Find $\cos(\theta)$.

Space for your solution:

Problem 2. Find $\cos\big(\arctan(-2)\big)$. More specifically, find an expression of this quantity that does not use any trigonometric functions.

Space for your solution:

Problem 3. For an arbitrary real number y, find $\cos\big(\arctan(y)\big)$. More specifically, find an expression of this quantity that does not use any trigonometric functions.

Space for your solution:

Problem 4. Solve the equation $\cot(t) = \sin(t)$.

Space for your solution:

Problem 5. In the triangle $\triangle ABC$, the sides $|AB| = 3$, $|AC| = 4$ and the angle $\widehat{BAC} = \frac{\pi}{8}$.

(1). Find the length $|BC|$.

Space for your solution:

(2). Find the angle $\widehat{ABC}$.

Space for your solution:

(3). Find the area of the triangle.

Space for your solution:

Problem 6. Find all complex numbers z, such that $z^3 = 27$.

(1). Express the equation in polar coordinates and solve for $|z|$ and $\texttt{Arg}(z)$.

Space for your solution:

(2). Find the solutions in Cartesian coordinates, i.e. in terms of $\text{Re}(z)$ and $\texttt{Im}\ (z)$.)

Space for your solution:

(3). Graph all the solutions on the complex plane.

Space for your solution: